Q.P. Code : 13506

[Time: Three Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B:
1. Question No. 1 is **compulsory**.
2. Solve any **three** questions out of remaining **five** questions.
3. Assume suitable data if required.

Q.1 a) Explain different type of Calibration Methods. 6

b) 0-150 Voltmeter has a guaranteed accuracy of 1 % of full scale reading. If actual reading is 83 V, Calculate the percentage error. 6

c) Explain: I) Turbine flow meter II) Piezoelectric Sensing Element 8

Q.2 a) what is the flow rate in m^3/hr of an electromagnetic flow meter generated an emf of 20 V water flowing through a pipe of 40 cm diamagnetic induction is 6 vs/m^2 10

b) Explain Mechanical and Electronic amplifier in Detail 10

Q.3 a) What is change in resistance of an electric resistance strain gauge, with gauge factor of 2.1 and resistance 50 Ω if it is subjected to strain of 0.001? 5

b) Suggest Appropriate Instrument for following applications with reason. 15

i) Measurement of flow of viscous Liquid
ii) Measurement of flow of Corrosive Liquid
iii) Measurement of Boiler and Furnace Temperature
iv) Level measurement of Bulk Solid
v) Measurement of absolute pressure

Q.4 a) Explain PLC in detail with simple program for on and off of a lamp. 10

b) A temperature sensor can measure temp from 30 degree to 200 degree a measurement result in a value of 120 degree calculate the error if i) ± 0.25% of full scale ii) ± 0.35% of span 5

c) write Short note on basic process control scheme 5

Q.5 a) An LVDT is used to measure displacement. The LVDT feeds a Voltmeter of 0-5 V range through a 250 gain amplifier. For a displacement 0.5 mm the output of LVDT is 2 mV, what is the sensitivity of instrument. 5

b) Explain SIL Classification in Detail 10

c) Explain importance of level measurement in detail. 5

Q.6 Write short notes on 20

a) Signal conditioning
b) Relief Valve.
c) Electromagnetic flow meter.
d) Variable Drives.